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## INDUSTRIAL DEVELOPMENT AND PERFORMANCE

### INDUSTRIAL INFRASTRUCTURE OF NATIONAL ECONOMY ANALYZED

Moscow IZVESTIYA AKADEMII NAUK SSSR-SERIYA EKONOMICHESKAYA in Russian No 6,  
Nov-Dec 84 pp 87-95

[Article by N. S. Solov'yev: "The Industrial Infrastructure of the National Economy"]

[Text] The article discloses the significance of the industrial infrastructure under the conditions of a developed socialist society and its influence on the effectiveness of public production. It considers the reasons for the existing lack of correspondence between the level of development of the infrastructure and the needs of the national economy. It touches upon the question of the development of an acceptable indicator for determining the degree of this correspondence and earmarks ways of achieving it.

The course toward intensification of public production means first and foremost effective utilization of the immense industrial potential that has been created in our country.

In order for the process of public production to take place normally it is necessary to have certain material conditions which are not directly "included in it, but without them it is altogether impossible or can take place only imperfectly" [1]. K. Marx included in these conditions roads, canals, storage facilities, those means of labor which in totality comprise the "vascular system" of production, and so forth. Because of them it becomes possible to exchange the results of public labor which is conditioned by the process of production itself and which can be considered complete only at the time of consumption, that is, when the product completely reveals its consumer value and becomes an "object" for an acting "subject." And consumption, as a rule, is separated from production in time and space. The link between these stages of production is mediated by a constantly repeated exchange of results of economic activity between the units of the society, the result of which is the circulation of the global product which is so necessary under the conditions of division of labor. "The coherent act of production," which should be continuous, presupposes continuity in the satisfaction of various kinds of technological needs for fuel, raw materials, processed materials, equipment,

and so forth, which conditions the movement of products from the place of production to the place of consumption, and also the creation of the necessary reserve of them. Therefore, taken as a whole, "the process of production becomes a mediating link in the process of circulation and vice versa" [2]. Moving goods, storing them, giving them a form suitable for production and so forth were regarded by K. Marx as processes of production which continue within the framework of the process of circulation, and he called them the "real functions" of circulation. It is precisely these functions of circulation that comprise the basis of the activity of the production infrastructure of the national economy.

Soviet economists began to use the term "infrastructure" in the 1970's to describe problems of regional development. Its subsequent widespread dissemination led to a diffusion of the concept of "infrastructure." In order to clarify the concept and determine the range of objects included in the infrastructure, several conferences were held,<sup>1</sup> which contributed to developing more general views regarding these issues. The different interpretations of the infrastructure which are still found in literature are explained mainly by the different levels at which economic analysis is conducted: the national economy, its spheres, branches, regions and so forth. Therefore one can speak about industrial and social-domestic infrastructures of the national economy, about infrastructures of the territorial-production or interbranch complexes (for example, the agroindustrial), or about the infrastructures of the enterprise or the population point with the corresponding group of economic units that form them.

When developing the comprehensive program for scientific and technical progress over the long range, research has been limited to the framework of the industrial infrastructure, which satisfies the needs of the national economy for shipment and storage of products, the needs of industry for material resources and information, and so forth.

The industrial infrastructure of the national economy is regarded as an independent structural constituent of the material and technical base of the society, whose economic role with the given resources and level of social and territorial division of labor consists in providing the general conditions for the functioning of production and the servicing of all units of the unified national economic complex with the goal of their continuous and effective activity. On the basis of this, the infrastructure can be regarded as a totality of various branches which form systems:

transportation (including of electric energy) with the network of communications;

information supply with the corresponding means of communication, gathering and storage of data and electronic computer equipment;

the provision of production with the necessary material resources (including water);

engineering support for population points.

These systems, which are different in the nature of their activity and technical type but are interconnected by their unified functional purpose, embrace completely enough the group of branches that provide for continuity of the production cycle and are the objective bases for the formation of the national economic interbranch complex of the production infrastructure.

In the absence of the necessary information and the effect of branch classification of material production, the composition of the industrial infrastructure when conducting prognosticatory balance calculations was limited to the branches of transportation, communications and material and technical supply (in certain cases resources of branches of procurements and trade were also taken into account). But even with this limited composition, the industrial infrastructure in 1980 accounted for more than one-fourth of all of the fixed production capital in the country and almost one-fifth of the industrial capital investments and employees in material production [3].

A close interconnection can be traced between the degree of the country's economic development and the condition of its industrial infrastructure. As research shows, with a rise in the level of economic development there is an increase in the proportion of resources that are used in the infrastructure. In turn, the infrastructure serves as a necessary prerequisite for effective functioning and development of the economy. The general patterns of the development of productive forces that are revealed by Marxist-Leninist economic theory consist in that essential changes taking place in public production entail with "ironclad necessity" a corresponding expansion and change in the infrastructure. Regarding this, K. Marx wrote: "...It is precisely a revolution in the means of production in industry and agriculture that made it necessary to have a revolution in the overall conditions of the social process of production, that is, in the means of communication and transportation. Means of communication and transportation of such a society, a pivotal point of which...was small-scale farming...and urban cottage production..., far from satisfied the needs of production during the manufacturing period with its expanded division of public labor, its concentration of means of labor and workers..., and therefore in fact there was an about-face. In exactly the same way the means of transportation and communication which had been handed down from the manufactory period were soon transformed into unbearable fetters for large-scale industry with its feverish and mass nature of production...." [1, p 395].

The creation of the economic foundation of the socialist society in the prewar five-year plans and the transformation of the country from an agrarian into an industrial-agrarian society placed increased requirements on the activity of the production infrastructure as well. But the construction of new enterprises and the increased output of key kinds of industrial products which determine the economic potential of the state (electric energy, steel, coal, petroleum and so forth) could rely on the already existing network of communications at first. As concerns the supply and sales activity and material support for the quantitatively growing cooperative ties, the tendency that was prevalent because of existing conditions toward universal and multiprofile production brought about a relative isolation of enterprises, pushing them along the path of departmental self-support.

With the expanded number of economic ties, the needs of the national economy for shipments increased. Their assimilation took place mainly as a result of increased loading of the existing main network of rail transportation, which in 1940 provided for 85 percent of the cargo turnover, since automotive and pipeline kinds of transportation were just being created. The main criterion for the economic effectiveness of this period was the speed of the achievement of goals set in this plane. It was not the construction of new mainlines, but the increased utilization and reconstruction of existing ones that contributed most of this criterion, and up to 80 percent of all capital investments in real transportation went for the latter. And the growth of the network took place mainly along with the assimilation and the drawing into economic circulation of new territories, and it lagged considerably behind the volumes of shipments, which led to an increased overloading of the railroads with cargo. In the final analysis the increased density of shipments no longer corresponded to the technical level of the railroads and in the middle of the 1930's caused strain in the functioning of the transportation which they managed to alleviate to a certain degree through additional capital investments. It should be noted that the fulfillment of the plan for capital investments in rail transportation at that time was not altogether satisfactory: the percentage of their fulfillment during the first five-year plan was 83 percent, the second--100.2, and the third--79.4 percent [4].

In the stage of developed socialism the scale of production and its technical level change the entire chain of economic ties not only quantitatively, but also qualitatively. It is clear that quantitative changes are related to the fact that "along with the scale of production and the increased productive force of labor...there is also an increase in the mass of raw material, auxiliary materials and so forth that are included in the daily process of reproduction" [2, p 138]. Under the conditions of the scientific and technical revolution and the high degree of social division of labor, simple cooperation is no longer sufficient. There arises a need to change the forms of organization of public production themselves, the essence of which is a changeover from relatively isolated universal enterprises to integrated industrial systems, in which each enterprise becomes a specialized unit of the whole. The more so since scientific and technical progress brings about a need for continuous updating of the production apparatus and, as a result, rapid changes in the technical equipment and technology, expansion of the list of products along with its unification and standardization, and the development of more effective forms of specialization of production (part-by-part, component and technological). Hence greater requirements are placed on branches of the industrial infrastructure which is becoming an indispensable part of production technology, as a result of which material support is provided for the ramifying cooperative ties [5].

Calculations made by workers of the VNIISI of the State Committee for Science and Technology and the USSR Academy of Sciences according to the method of M. Bennett as modified by Hungarian economists show that at the present time the level of development of the USSR industrial infrastructure is lagging behind the needs of the national economy. As comparisons among countries show, it is lower than in certain industrially developed countries [6]. Yet one should keep in mind that each country typically has its own level of the infrastructure, which is determined by the amount of territory, the

topography, the density of economic ties, the density of the population, and so forth.

In spite of the need for such calculations and comparisons, which give a relative qualitative characteristic of the development of the industrial infrastructure, it must be noted that the results are not precise quantitative evaluations, but "rather reference points in the area in which without them it would be generally impossible to have any kind of quantitative commensurability" [7]. Moreover, in the opinion of Hungarian economists, the possibility of constructing such a quantitative generalizing indicator is "deliberately excluded" as a result of the heterogeneity of the elements that comprise the infrastructure.

Here one can draw an analogy with the works for determining the effectiveness of public production which, in spite of existing difficulties, still obtain an evaluation. The practice of planning and prognostication also need worked-out normatives for the development of the infrastructure and the provision of its services for the national economy. Work is already being conducted in this area, but so far it has not gone beyond general statements of the problems [8].

The difficulty of developing such normatives consists also in the fact that in theoretical research on economic problems of the development of socialism during the past decades priority has been given to the sphere of production--the determining phase of reproduction--as the country's economic potential grows, more and more attention has been devoted to the theoretical and methodological questions of production. But the stage of circulation and its interconnection with production have been studied quite insufficiently, although expansion of the production of material goods, considered in and of itself, cannot serve as the only criterion for successful development of the economy if they have not been consumed. Therefore the activity of the branches of the industrial infrastructure should be evaluated from the standpoint of growth which is balanced with the branches of material production and satisfies the needs of the national economy.

The first step which can be taken in this direction consists in revealing the quantitative ratios of resources that are used in production and circulation. In the sphere of circulation there are products only from industrial and agricultural production and if one is to compare their total volumes in terms of the output of products, fixed production capital and capital investments with the corresponding indicators of branches of the industrial infrastructure, the following results are received (Table 1).



Table 1.

<u>Year</u>	<u>For Gross Output</u>	<u>For Fixed Capital</u>	<u>For Capital Investments (Five-Year Plan)</u>
1950	11.6	2.2	2.4 (I-III)
1955	11.3	2.2	4.7 (V)
1960	9.6	2.4	4.1 (VI)
1965	9.7	2.4	4.0 (VII)
1970	9.8	2.5	4.2 (VIII)
1975	9.5	2.6	4.2 (IX)
1980	9.2	2.7	3.8 (X)

As one can see from the figures that are given, fixed capital of the branches of industry and agriculture during the entire period under consideration increased more rapidly than did the capital of branches of the industrial infrastructure. As industrial and agricultural production increase, the increasing disparity between the capital availability increases the load on the material and technical base of branches of the infrastructure, which reacts to this by reducing its services per unit of their gross output.

In past five-year plans, under the influence of the requirements of production, and also in connection with the ordering and improvement of management systems in industry there has been a process of formation of production and scientific production associations, the number of which has increased from 608 in 1970 to 4,206 in 1982 [9]. At the same time one can trace a tendency toward consolidation of combines and enterprises that are on independent books. Their number (not including those that are parts of production associations) have decreased constantly right up to 1980: in 1970 there were 46,800 of these enterprises and combines, in 1975--37,200, in 1980--26,300, and in 1982--27,000 [9, p 109]. The natural result of these organizational measures was an average 2.1-fold increase in the output of products per one industrial enterprise during these years. As for agriculture, the overall number of economic units (kolkhozes and sovkhoses) changed quite insignificantly: in 1965 there were 48,600 of them, and in 1982--48,400. The only changes were in the ratio between the forms of property: during this period the number of sovkhoses increased from 11,700 to 22,000, and the number of kolkhozes decreased from 36,900 to 26,400 [9, p 188], although the formation of production agroindustrial and scientific production associations to some extent influenced the overall number of economic units involved in the production of agricultural products.

The organizational changes directed toward increasing the effectiveness of production also bring about changes in the requirements for the development of transportation, material and technical supply, and communications. But while during the period of 1961-1980 the average production of products per one total economic unit in branches of industry and agriculture increased 4.3-fold, the capital availability per one kilometer of main railroad, highway and pipeline increased less than twofold.

The existing situation is the result of inadequate capital investments in the development of the industrial infrastructure for many years: during 1928-1940 the volume of capital investments in the industrial infrastructure was five-twelfths. The amount of capital investments that were made in industry and agriculture; during 1951-1965--ten-fifty-thirds and during 1966-1980--ten-forty-ninths. During the past five-year plan this disparity decreased and there is a tendency toward its reduction under the current five-year plan as well. In the foreseeable future there will be a large amount of difficult work to do to eliminate the consequences of this disparity in capital investments.

Under the conditions of developed socialism, in which the USSR economy is a unified national economic complex which embraces all units of public production, distribution and exchange on the territory of the country, the smoothness and, in the final analysis, the functioning of the national economy as a whole depends largely on the degree of the development of the branches of the infrastructure. For the quality of the functioning of the industrial infrastructure predetermines to a considerable degree the rhythm and continuity of the operation of the base branches of the economy which it serves by providing for normal progress of the entire process of reproduction. But when analyzing the modern condition of the infrastructure one reveals certain changes that are not always favorable in the overall conditions of this process in the stage of circulation, which are reflected in the growing current production supplies and commodities en route.

The dynamics of these indicators can perhaps serve as an evaluation of the degree of correspondence of the development of the infrastructure to the needs of material production. For the longer the time interval during which part of the total product is constantly retained in the sphere of circulation, the lesser will be the part which can be used as a means of production in another sphere.

It is known that with an increase in the scale of production there is also an increase in the absolute amount of reserves. But with an increase in the production force of public labor, their relative amount should decrease. The level and dynamics of reserves are formed under the influence of various factors, the most important of which are balance of national economic plans, the efficiency of the cooperative ties that have taken form, and the degree of development of branches of the infrastructure.

A decisive role in the formation of reserves is played by proportional development of the economy in which, however, "a shortage of the main objects of industrial consumption remains in spite of the fact that their production is continuously growing" [11]. Another thing of considerable importance is increased reliability and substantiation of economic ties between producers and consumers, taking into account efficient distribution of productive forces. The decisive influence of these factors on the amount and structure of the reserves does not eliminate the influence on them by infrastructural factors: the speed, regularity and stability of deliveries of masses of raw material, and so forth, which is necessary for providing for continuity of production.

The overall change in the relative amount of circulating capital in the reserves of commodity and material values per unit of industrial and agricultural output can be characterized by the following figures (kopecks/ruble and %):

<u>1960</u>	<u>1965</u>	<u>1970</u>	<u>1975</u>	<u>1980</u>
29.8	32.7	34.6	37.1	42.1
100	110	116	124	141

Current production reserves increase even more rapidly with respect to the unit of total output of industry and agriculture (%):<sup>2</sup>

<u>1960</u>	<u>1965</u>	<u>1970</u>	<u>1975</u>	<u>1980</u>
100	115	127	130	150

This situation with respect to reserves took form as a result of the irregular rhythm, the weak delivery discipline, and the inefficient operation of transportation, material and technical supply, and communications. Moreover, such a way of adapting to the conditions of management as increasing (sometimes up to 20 percent) orders for raw and processed materials became widespread among consumers. As a result, production resources lie idle in the sphere of production, deprived of the necessary mobility and slowing up the process of reproduction. The dispersal of supplies among thousands of warehouses of consumer enterprises belonging to various departments contributes to this. When the information service is not arranged efficiently enough, when there is a shortage of technical means of communication, when there is a lack of stable contacts among interdepartmental partners, when efficiency is poor and when the demand for the necessary raw or processed materials goes unsatisfied for many months, and it takes many weeks of correspondence and coordination to transfer surpluses, then skillful maneuvering of the limited resources is extremely difficult. Recently the CPSU Central Committee and the USSR Council of Ministers have adopted a number of additional measures for eliminating these negative phenomena.

There has been a certain improvement in the work of transportation and the activity of material and technical supply, as general secretary of the CPSU Central Committee K. U. Chernenko noted in his speech before the voters, and up to this point this comes from reserves which are, as they say, on the surface. Considerable additional efforts are needed in order to eliminate that tension with which transportation, for example, functions, and primarily rail transportation which met with a number of serious problems under the past five-year plan. The average network indicators reflect a constant growth of the average distance of shipments of cargo, a reduction of the average daily running time of a cargo car, an increase in the average amount of time for delivering cargoes, and a tighter schedule for cargo shipments (Table 2).

Table 2

	<u>1950</u>	<u>1960</u>	<u>1970</u>	<u>1980</u>	<u>1982</u>
Average distance of freight shipments, km	722	798	861	923	930
Average daily mileage of freight cars, km	146.4	227.0	255.5	227.0	223.7
Average time for delivery of freight, days	4.9	3.5	3.4	4.1	4.2
Density of freight shipments, millions of ton-km/km	5.2	12.1	18.5	24.3	24.3

The generalizing indicator for the tension in the work of transportation can be the increase in the commercial mass which is en route. Its dynamics with respect to the total output of industry and agriculture has the following appearance (%).<sup>3</sup>

<u>1960</u>	<u>1965</u>	<u>1970</u>	<u>1975</u>	<u>1980</u>
100	90	96	106	127

Keeping part of the global social product in the stage of circulation has an appreciable effect on the efficiency of the entire process of reproduction. One can gain an idea of the degree of this influence from a calculation which was made from materials of the statistical reference work, "The USSR National Economy During 1980," which showed that if the relative amount of current production reserves and commodities en route in 1980 had remained at the 1975 level, their volume could have been reduced by more than 34 billion rubles. With the proportional capital-intensiveness of the increase in industrial and agricultural output under the 10th Five-Year Plan, which was equal to 2.62 rubles, it would have taken approximately 90 billion rubles of capital investments in order to produce this sum of products. Yet in 1976-1980 79.5 billion rubles' worth of capital investments were expended on the development of transportation and communications.

Undoubtedly the inadequate allotment of resources for improving the industrial infrastructure caused the fact that its material and technical base is behind production. But this is not the only reason. The situation was exacerbated to a considerable degree by the unjustifiably high additional load on branches of the infrastructure, especially transportation. There was a certain divergence between the national economic interbranch nature of the activity of the industrial infrastructure, as a result of which the general conditions for the production of the global product were provided and the very process of its circulation in the national economy takes place, on the one hand, and, on the other, the primarily nature of the utilization of existing national economic resources, whose distinctive feature with respect to infrastructural services is essentially only the demand for them, and since the demand is not always and not fully satisfied, instead of the development of an integrated national economic infrastructural complex, intradepartmental infrastructural subdivisions are created. An example of this is the Western Siberian

Petroleum and Gas Region in which geologists, petroleum extraction workers, gas extraction workers, construction workers, and river transportation workers have expended considerable material and labor resources on the creation of intradepartmental communications systems [12].

This is becoming possible because only ministries and departments are the distributors of the production resources allotted under the established production plan. But what with the frequently encountered violations of planning and contractual discipline, the departments are trying to limit the economic ties to the framework of their own system, paying no attention to the spatial distribution of their enterprises and reducing contacts with suppliers outside them to a minimum. Expansion of intradepartmental cooperation is promoted by the circumstance that expenditures on the shipment of consumed materials and prepared products are practically not reflected in the results of the economic activity of the enterprises. The lack of economic interest on the part of the departments in reducing transportation expenditures is brought about by the fact that they are established in the plan from "what has been achieved" taking into account new transportation outlays.

The country produces approximately 25 million kinds of products, and it is practically impossible to establish centrally in the national economic plan the routes for the shipments of specific cargoes. Thus the volumes and routes of shipments are determined by the departments, which also become the actual distributors of the transportation resources. Thus, for example, the average radius of shipments of products from the general machine-building industry exceeds the efficient radius 2.5-3.5-fold: stamped pieces are shipped over an average of 1,300-1,500 kilometers, and forged pieces--1,700-2,000 kilometers. The distance of shipment of crushed stone is 1,000 kilometers. More than 55 percent of the reinforced concrete items and structures, which are produced in every oblast, are shipped to other oblasts and krais, regardless of the distance [13]. The national economy is annually forced to spend more than 1 billion rubles on efficient shipments [14]. Supply agencies, as a rule, do not influence the improvement of cargo flows, and transportation workers, because of the fact that the shipments are paid for by the consumers, are not concerned about streamlining the routes either. Less than half of the proposals of the existing Interdepartmental Commission for Streamlining Shipments Under the USSR Gosplan are carried out, because of the opposing actions of the departments which justify all of their decisions by industrial need. Therefore the December (1983) Plenum of the CPSU Central Committee seriously drew the attention of management workers to the reduction of inefficient shipments, suggesting "thoroughly looking into this issue and developing the necessary measures...to eliminate many shipments of the same products in opposite directions and unnecessary shipments which are burdensome to the economy."

Among the reasons why the needs of the national economy for the services of the infrastructure are not fully satisfied one must also name the existing organizational shortcomings which are engendered by departmental separation of the infrastructural branches themselves, which so far do not make it possible to speak fully about the production infrastructure as a national economic complex. Indicators of the activity of each of them are only indirectly related to the final result--the provision of general conditions for the

achievement of continuity, rhythm and effective production. Therefore the problems of coordination arise first and foremost at the junctures of the various systems. As the experience of Leningrad, Lvov and other cities, which was approved by the CPSU Central Committee, has shown, their solution requires not additional capital investments, but mutual coordination, "joining" of economic interests of industrial workers, transportation workers, supply workers, communications workers and so forth.

There is no doubt that the national economic plan joins all enterprises with one another even before the process of production, and therefore problems of sales, which are central under capitalism, do not exist in our economy since socialist products enter circulation intended for satisfying a previously determined need on the scale of the entire national economy for means of production and objects of consumption. But this overall approach to describing one of the stages of reproduction--circulation--cannot serve as a basis for making decisions regarding questions of the economic strategy of its development. For the material-substantial and organizational-technical aspects of the process of circulation acquire primary significance when making decisions, and they also react to the existing forms of management which still make it possible to develop production plans, delivery plans (exchange), and plans for shipment without the necessary intercoordination. Thus the central planning agencies, when determining the production volumes, use the consolidated products list. Supply and sales organizations when providing for their distribution among the consumers utilize an already detailed products list. Transportation workers have their own list of cargoes and plan for shipments. The division of functions of planning the production of products, their distribution and their shipment which exist to a certain degree opens up possibilities for interruptions in the rhythm and breaks in the continuity of production. The more so since interdepartmental relations are not regulated efficiently enough and reciprocal measures of responsibility, the corresponding sanctions and stimuli are still extremely ineffective.

Further increase in the effectiveness of public production dictates the need to bring the industrial infrastructure in line with the needs of the national economy. A changeover to intensification of public production is closely related to a particular period of extensive development of the industrial infrastructure and the redistribution of capital investments in its favor. It is necessary to strengthen the material and technical base of its branches, to expand the network of communications, to increase warehouse capacities, to provide for telephone communications and so forth. It is also necessary to carry out a radical organizational restructuring of the relations between the infrastructure and production and within the infrastructure itself with the simultaneous improvement of the corresponding economic levers. A great deal of assistance in this should be rendered by the large-scale economics experiment in improving the economic mechanism which is being conducted at the present time.

Increased effectiveness of the work of the base branches of the economy served by the industrial infrastructure as a result of greater mobility of the material resources that are used, greater reliability of economic ties and reduced losses of products that are already produced in the future depends to

a considerable degree on bringing the development of the industrial infrastructure in line with the needs of the national economy.

#### FOOTNOTES

1. The all-union conference, "Effectiveness of the Development of the Infrastructure in the USSR National Economy"--November 1980, the all-union seminars, "Problems of the Functioning and Development of the Industrial Infrastructure"--April 1981 and "Problems of the Development of the National Economic and Regional Infrastructure"--October 1983.
2. The calculation was made according to the methods and materials of G. V. Zenkova.
3. The calculation was made according to the methods and materials of G. V. Zenkova.

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13. PLANOVOYE KHOZYAYSTVO, No 4, 1983, p 8.

14. SOVETSKAYA ROSSIYA, 15 May 1984.

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## REGIONAL DEVELOPMENT

### AGANBEGYAN DISCUSSES DEVELOPMENT IN BAM REGION

Moscow IZVESTIYA in Russian 20 Nov 84 p 2

[Interview with academician A.G. Aganbegyan, chairman of the USSR Academy of Sciences Scientific Council on BAM problems, and corresponding member of the USSR Academy of Sciences V.P. Chichkanov, deputy chairman of the Scientific Council on BAM Problems, by B. Konovalov: "The Decisive Factor"; date and place not specified]

[Text] In his speech at the CPSU Central Committee Politburo meeting comrade K.U. Chernenko called the ahead-of-schedule start of the movement of working trains along the Baykal-Amur Main Railroad Link an outstanding event. The collectives of construction workers along the BAM have achieved a notable victory. Work continues on this truly national construction site. Its prospects and problems have been examined in depth in pieces written by the IZVESTIYA out-of-town editorial office which has now been operating for almost 4 months along the BAM route. The newspaper intends to return again to the subject of the BAM in the future.

This great construction site has now embarked on a new stage. As is known, the Baykal-Amur Main Railroad Link is to become the basis for industrial development in an enormous area. Some 1.3 million people now live in the economic zone being opened up by BAM, and by the end of the century this figure should top 2 million. What kind of social problems now concern those living along the BAM? We discuss this today with academician A.G. Aganbegyan, chairman of the USSR Academy of Sciences Scientific Council on BAM Problems, and corresponding member of the USSR Academy of Sciences V.P. Chichkanov, his deputy.

[Question] Abel Gezevich, the scientific council that you head has conducted 19 out-of-town sessions on the BAM, a main link that has been born there right before your very eyes. What have been the most important things during the last 10 years?

Aganbegyan: The main achievement, of course, is that it has been possible to create a powerful, cohesive collective of 100,000 construction workers for the Glavbamtroy, whose work has been highly assessed by the party and government. Now the construction worker both on the BAM and in any other region that is being opened up is the main figure. The reality of all plans depends on his skills and on how he works. And BAM has become a fine forge for construction workers.

Another no less important achievement has been the successful form of patronage assistance from the various republics, krais and oblasts in the country; this has played a colossal role in the construction of BAM settlements and cities.

If we talk about the "flies in the ointment" in BAM's "honey jar" then the "darkest" of them and the one fraught with the most dangerous consequences during the period that the zone is being opened up is the lagging that has been permitted in the development of housing, children's establishments and everyday establishments--everything that is called the social infrastructure. This may check the scales on which new people are attracted to BAM and increase personnel turnover. Accordingly, at BAM the 12th Five-Year Plan should become a five-year plan of accelerated social transformation. The disproportions that have been allowed must be smoothed out at faster rates.

[Question] In your opinion, is this the main reason for personnel turnover? Valeriy Petrovich, what is shown by the sociological studies that have been conducted by the USSR Academy of Sciences Far Eastern Scientific Center Institute of Economic Studies, which you head, and other organizations?

Chichkanov: People have gone to BAM for the most varied reasons, from a lofty sense of patriotism or even romanticism, to frankly prosaic reasons. Studies conducted among young construction workers aged up to 30 show that the number of those at BAM for motives of a patriotic nature who intend to remain there is 2.9 times greater than those who have gone with the aim of improving their material position. The "settlement" process is taking place particularly successfully in places where the youth brigade has been formed in combination with experienced mentors, and where labor has been properly organized. Satisfaction from good labor and the ability to see results and feel its usefulness to the motherland all constitute a very powerful incentive.

One important question is improving practical work in the organized recruitment of the labor force sent to BAM. For example, we conducted a study of construction workers who had gone to the new city of Amursk in accordance with organized recruitment. Some 65 percent of them had previously gained no kinds of skills. And only 15 percent were real construction workers. The question begs to be asked: why send a person to the back of beyond and pay him much more than he would get in an inhabited region just so that he can master an occupation there?

It is time to draw some conclusions from the medical-sociological studies done on the process of adaptation, during which time, of course, a person's work capacity is lower. Under the severe conditions of BAM this takes 1.5-2 years. As a rule anyone who works there for 3 or 4 years, and especially 5 years, becomes acclimatized for a long time. But the contract systems are based on

work for 3 years. It follows that only a person who feels at home there and becomes accustomed to things and is prepared to work his best should go there. In our view, contracts should be set for 5 years, with provision of material compensation for the longer stay at BAM, especially for young specialists sent there on assignment.

Migration by the BAM population is still too great. Although the actual opening up of the BAM zone took place with a constantly changing population during the initial stage.

Of course, the lagging in development of the social infrastructure is playing a major role in this migration. In Tynda, for example, only 4.5 square meters of well-built housing are available for each person. Everywhere along BAM these norms are still lower than for the RSFSR and the territories of those oblasts through which BAM passes. The annual volume of everyday services in the BAM zone is R20 per person, while in the RSFSR the figure is R31.5. The availability of hospital beds is only 59 percent of the level in the RSFSR. And more account must be taken of the specific features of BAM. The settlements in the BAM zone are dispersed and accordingly the number of physicians per 10,000 should be more than in the European part of the USSR. The makeup of this young population means that norms should be higher for the availability of creches, kindergartens and schools. In the BAM zone the birth rate is 22 per year per 1,000 inhabitants. The birth rate figures for the entire country are 18 per 1,000, and 15 per 1,000 for the RSFSR. Accordingly more children's establishments should be built than the average for the RSFSR; meanwhile BAM remains below the republic average.

It is clear that more attractive conditions must be created for living, taking into account the severe nature of the area, for the planned and stable recruitment and consolidation of the population in the BAM zone.

[Question] But, let us say it directly, these severe natural conditions are compensated materially. Does this incentive not work?

Aganbegyan: Money does not provide the answer to everything. And not for everyone. And using the ruble as an incentive to attract people to new places must be done more carefully than it is now. For construction workers working on the railroad link itself, everywhere the regional coefficient added to wages is 1.7. For those operating the railroad it is 1.4. For workers in industry, agriculture, construction and the services spheres it varies between 1.2 and 1.6. But this is a regional coefficient! It is given for the severity of the living conditions in a specific region. Why, then, is it different for different occupations? Economists think that in each region or city this coefficient should be the same, while any difference in working conditions should be compensated by other additions. And we do not understand why the regional coefficient is not taken into account in pension buildup; as if a person had been working in Sochi [a pleasant vacation resort on the Black Sea--ed] rather than on the BAM.

On the other hand, is it not shameful that a construction worker who has already been working on BAM for 5 to 7 years, lives in a trailer, while, let us say, a fitter who has just arrived at a locomotive depot obtains a fine apartment?

The fact that a railroad construction worker is paid more should, of course, be tolerated, it is somehow just. But we forget one simple psychological thing: people quickly become used to high wages, but they never get used to poor living conditions.

[Question] All who go to the North are familiar with the feeling of temporariness among those working there. You see a person who has already been working there for 10 years, and he lives as if he were about to leave tomorrow. Has this "virus of temporariness" also infected BAM?

Aganbegyan: Unfortunately, the psychology of temporariness is typical not only of individuals but of entire departments. And this sickness (this is what it must be called) must be overcome. For the Ministry of Transport Construction the main thing has traditionally been roads. People are "here today, gone tomorrow." The road is opened and the people move on. In a sense there is no need to create fine settlements and subsidiary economies for them, or to develop a construction base. But is it wise to construct "temporary buildings" in places where later a permanent railroad station will be built?

Again, traditionally the Ministry of Transport Construction has not been concerned about its subcontractors. Within that ministry the various subdivisions are separated by strict departmental barriers. And even if they are all working in the same place, the bridge builders, the explosives men, the communications people, the workers in the motorized columns all create their own temporary settlements through their own efforts. An obviously amateurish approach! Nevertheless, it has also come to BAM. But BAM is a special construction site. It has already been under construction for 10 years and work will continue to the end of the century. And what has happened? In Tynda 14 of the 17 local housing developments are temporary: beams and trailers, temporary clubs, temporary creches, temporary kindergartens, temporary schools. It is as if the people should leave, but they stay on. The city's population has now topped 50,000. And naturally they all want to live under normal conditions. The temporary arrangements will inevitably be cast aside. So it is right what they say: false economy costs three times as much.

At the major construction sites the Ministry of Transport Construction should copy the experience of the Ministry of Power and Electrification, which, when starting on the construction of, say, a hydroelectric power station, immediately creates a main city settlement with all conveniences for itself and for all subcontractors.

As so now, when a start is made on the economic opening up of a zone, it would be worthwhile setting up "proper rear services" instead of temporary ones. And paradoxically, over the last 10 years BAM has failed to create its own major construction base, if you do not count the small Shimanovsk Housing Construction Combine, which produces buildings that result in complaints from the BAM people. For most of the settlements the houses are brought in by patrons living at the other end of the earth.

[Question] Many of the BAM cities and settlements have been made beautiful, but the specific local conditions have not everywhere been taken into account. The houses are just like those in Moscow or Kiev. In Urgal, a fine city built

by patrons in the Ukraine, the great happiness is to get hold of a single-family house with a cellar. For all around the tayga there are mushrooms and berries and good fishing and hunting. In Bodaybo, where conditions are even more severe, I saw enterprising inhabitants building three-storey garages, with a cellar beneath and a greenhouse above. You do not see these along BAM. But should not the architects be thinking about how a person lives in these spacious places in the tayga? Why copy European conditions?

Chichkanov: At some of the BAM stations now under construction these errors will be taken into account. There, provision has been made for individual houses with apartments on two levels, with a garden area and greenhouses. It seems to me that with further development it will be necessary to alter the structure of the housing inventory so as to try to make housing an extra incentive to get people to stay in the BAM zone. Hostels for the single newcomer, a hotel-type house for the married. The creation of families must be encouraged in every possible way; this reduces migration more than anything else. When a child is born, an apartment should be immediately available. And another good idea would be to offer an apartment in an individual house after 5 years of work.

More thought must be given to nonmonetary incentives to attract people to the BAM zone. Patronage should also be considered from this standpoint. Many republics are now taking the initiative in continuing their patronage over BAM through the period of its economic development. Georgia and Moldavia have fulfilled their pledges and have already started on the construction of new stations.

This is a very important and useful initiative. In our opinion, many of the administrations should also participate in patronage. The sociological studies show that for the BAM people the main cultural diversions are reading books, the cinema, and television. There is a major lack of dealings with interesting people. Their own "stratum" of the intelligentsia is still small. It would be useful for the Ministry of Culture and the "Znaniye" society to engage in patronage for the BAM people and offer a stable supply of rich dealings with writers, scholars and artists. The Ministry of Higher and Secondary Specialized Education could consider setting up branches of VUZ's and tekhnikums. The USSR State Committee for Sport could assume patronage over the physical culture movement.

The Ministry of Health and the AUCCTU could do a great deal. On the BAM itself there is still only one resort, at Ust-Kut, where the restorative muds are excellent but where alas! everyday day conditions are not. And in the BAM zone itself many sources of various kinds of therapeutic waters have already been surveyed, on whose basis it would be possible to create resorts. They are often already used by the "wildcats."

BAM needs its own seaside resort. Trips to Sochi cost a pretty penny and the number of such trips is restricted. Meanwhile there are wonderful sandy beaches in the Maritime Kray, and hilly regions in the tayga where measured jogging paths [terenkura] just as good as at Kislovodsk can be set out. Just construct a pool using sea water and you have a year-round resort.

This year a Far East "Artek"--the "Okean" pioneer camp--was opened in the picturesque Shamor Bay near Vladivostok. This camp will accept BAM children. It is necessary to think about a resort for adults, where as many as possible could also go with their children.

[Question] Probably the resolution of this question, like many others, will depend on how successful we are in overcoming the departmental barriers in social planning. Meanwhile, the overextension of resources does harm in this matter. At Ust-Kut, for example, the railroad workers have their own hospital, so do the inland-waterway workers, and so do the city inhabitants. Even though it is clear that three small departmental hospitals are not as good as a single, large hospital provided with up-to-date equipment and a large staff. In a small hospital if just one surgeon takes a vacation this already creates a problem. In a large hospital this can happen without any harm coming to the patients. Nevertheless, the departments try to maintain the principle of "it's small, but it is our own." Obviously state measures are needed to overcome this.

Aganbegyan: Yes, and this started to be seen right from the start of economic development in the BAM zone. In Neryungri, for example, the Ministry of the Coal Industry built a modern city for 60,000 inhabitants, with a good reserve "for growth." Notwithstanding, the Ministry of Power and Electrification, which was constructing the Neryungri GRES, created its own settlement 10 kilometers away from the coalminers'. And it turned out to be more expensive and not as good.

Unfortunately, the local organs of soviet power do little to oppose the appearance of this kind of narrow departmentalism.

Experience has been gained in the country whereby all departments hand over funding for social development to the local soviets and act as a single client. It is essential to use this principle on BAM also when a guarantee can be offered that social questions will be resolved along with production questions.

True, it should be noted that social conditions are not the only reason for personnel turnover. The lack of any precise long-term prospects in labor activity also plays a negative role. Both the individual and the collectives have to organize their plans for life themselves. They always want to know what they will be doing tomorrow and the day after tomorrow. It is difficult to create a good collective; and in order to maintain one it is absolutely essential to outline development plans, otherwise it disintegrates. Thus, for example, a fine collective of hydrotechnical construction workers was formed at the Zeyskiy GES. But the delay in resolving the question of construction of the Bureyskiy power station led to a situation in which many specialists started to leave. And then later at the Bureyskiy GES it was necessary to find other construction workers to make up the complement.

Now, even though work is available, people are beginning to leave the central part of BAM because they do not know what the prospects are. Management decisions should be taken in good time so as to prevent loss of the most valuable things that we are creating in the extreme conditions of Siberia and the Far East--the collectives that have been formed. Man does not live by

bread alone; he must know where he will be working in the future. And so it is very important that plans be mapped out for the continuation of the "Little BAM" to the north, to Tommot and then, evidently, to Yakutsk.

The economic development of the BAM zone is a gigantic, state goal-oriented long-term program. And it is important that it is built on the basis of efficient methods of program, goal-oriented planning, scientifically verified. Even if funding goes to the sectors it should necessarily be goal oriented. A single management organ is needed for this goal-oriented programmed development of a territory covering 1.5 million square kilometers with natural resources that are "in the possession" of the most varied ministries and administrations. And an authoritative organ capable of "bringing to his senses" any official who would like to act from a narrow departmental position rather from a state position.

But the basic position is simple: as we develop the economy of this rich region we should not for one moment forget that the chief production force is the individual.

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## REGIONAL DEVELOPMENT

### TRENDS IN ESTONIAN ECONOMIC DEVELOPMENT REVIEWED

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[Article by M. Bronshteyn, corresponding member of the Estonian SSR Academy of Sciences: "The Strategy Intensive Development"]

[Text] In March of this year in Moscow the CPSU Central Committee convened the All-Union Economics Conference on Problems of the Agroindustrial Complex, at which they discussed urgent problems of implementing the decisions of the May (1982) Plenum of the CPSU Central Committee and the USSR Food Program. Positive strides in the development of the country's agrarian sector were noted: during 1983 the gross agricultural output increased by 5 percent (in our republic, by 9 percent). For the first time in the past 9 years all republics fulfilled their plans for the procurement of the main kinds of animal husbandry products. The economies of the farms were strengthened--the total profitability of agricultural production in the country reached 21 percent (in our republic--38 percent). The increased procurement prices, the positive changes in the economy, and also the favorable weather conditions had their effect.

At the center of attention at the conference were unsolved problems and difficulties related to the growth of the agrarian sector. For 3 years of the five-year plan the growth rates of production and procurements did not correspond to the planning indicators. In terms of these, agriculture failed to provide the state with a considerable amount of grain, cattle, poultry, milk and other products. The main thing is that the necessary changes had not taken place in the strategy for economic growth, the methods of management and in economic thinking itself.

In agriculture, as in other branches of the economy, there is a predictable changeover from primarily extensive methods of expanding reproduction to its consistent intensification. This is associated both with the accumulation of the country's economic potential and with the further limitation of the land and labor resources. It is known that during past decades alone the area of



arable land per capita in the USSR has decreased significantly as a result of various objective factors. It was 30 years ago when we assimilated the last large area of virgin land with relatively high natural fertility. The introduction into agricultural circulation of less suitable land would require a multiple increase in expenditures. Therefore the March (1965) Plenum of the CPSU Central Committee and subsequent congresses and plenums of the party Central Committee worked out a strategic course for the development of agriculture toward consistent intensification on the basis of comprehensive mechanization of production processes, chemization, land reclamation and the introduction of advanced technology and organization of production.

During the past decade alone investments in comprehensive mechanization of production, chemization and land reclamation amounted to 300 billion rubles, that is, a 2.3-fold increase over the 1960's. The volume of agricultural output per 1 hectare increased 1.3-fold during this time. But these same figures show the prevalence of a resource-intensive direction for the intensive development whereby the growth of investments per unit of land area outstrip the increase in the output of agricultural products many times over.

Attempts have been made in economic literature to present such a large divergence between investments and output of products as a natural result of the changeover of agricultural production to an industrial basis, which presupposes a lack of correspondence in time of the periods of considerable increase in investments and their subsequent return. This is indeed true to some degree and it is confirmed by the experience of a number of countries that have carried out industrialization of agriculture. Nor can one forget about the unfavorable climatic conditions. But these processes cannot justify such a rapid increase in capital-intensiveness of agricultural production and such a deepening of the disparity between the increase in the capital-availability of agriculture and the growth of production (the tendency toward this was noted during the past decade). Thus for a 1-percent increase in the gross agricultural output under the 8th Five-Year Plan there was a 1.8-percent increase in fixed production capital, under the 9th--3.19 percent, and under the 10th--a 4.22 percent increase. Hence the regular increase in the production cost of agricultural products (taking into account the increased value of production capital).

It is not only a problem of the negative consequences of the resource-intensive direction of intensive development. During the 1980's we have come up against an increasing limitation on capital investments in agriculture and the agroindustrial complex. This has been brought about by the need to carry out a number of large-scale and capital-intensive programs with a considerable increase in the cost of extracting fuel and raw material, a deterioration of the demographic situation and increased international tension. Previously there was the possibility of increasing the proportion of agriculture and the APK in national economic investments, but now, in essence, we have reached the limit of growth--27 and 33 percent, correspondingly, of the country's overall investment fund. Under the 10th Five-Year Plan for each 1 percent of increase in the country's gross agricultural output there was a 2.27-percent increase in capital investments in this branch, under the 11th Five-Year Plan it was planned at 0.53 percent and for the 12th Five-Year Plan--0.64 percent of the increase in capital investments. For the Estonian SSR the corresponding

indicators under the 10th Five-Year Plan amounted to 1.43 percent, under the 11th Five-Year Plan--0.64 percent, and under the 12th Five-Year Plan--0.51 percent. For each unit of increase in the gross agricultural output under the 11th Five-Year Plan in the country there is to be an increase of 1.26 units of fixed production capital, and under the 12th Five-Year Plan--1.42 units.

We are speaking, in essence, about a radical change in the strategy for intensive development of agriculture--a changeover from a resource-intensive to a resource-savings strategy of investment growth. Here the effectiveness of the utilization of production capital and capital investments should increase at least 2-3-fold, on which, in the final analysis, the time periods for the implementation of the Food Program depend. In his speech at the All-Union Economics Conference, Comrade K. U. Chernenko said that "the main path to the achievement of what has been earmarked is acceleration of the transfer of agriculture to an intensive basis of development, and a considerable increase in the return from the potential that has been created on the kolkhozes and sovkhozes." They pointed out at the conference the erroneousness of the understanding of intensification as a quantitative growth of investments per unit of farmland. The main thing in the strategy for intensive development is increasing the output of products per unit of resource potential (land, capital, labor force).

Is a considerable increase in the effectiveness of the utilization of the accumulated resource potential possible? The feasibility of the task that has been set is shown by the experience of a number of leading rayons and farms in our country, and also by certain other socialist countries. But this path is not easy and it requires a radical break from the existing stereotypes of economic thinking and management practice which are directed toward obtaining a reduced plan and increased deliveries of resources. It is also necessary to make large structural changes in the investment policy and systems of farming, and especially in the management of the agrarian sector of the economy and the economic mechanism.

In his speech at the All-Union Economics Conference, Secretary of the CPSU Central Committee Comrade M. S. Gorbachev singled out three main directions for increasing the effectiveness of the utilization of the accumulated resource potential and investments in the agrarian sector.

The first direction: to bring the existing capital into an optimal ratio, to improve its structure and to strengthen the weak links. In other words, it is necessary to achieve an optimal balance of factors in intensive growth in the APK as a whole, and also between production and the industrial and social infrastructure.

For greater clarity we shall use the model of effectiveness proposed as long ago as in the last century by the German agrochemist J. Liebig. He compared the final effect with the level of liquid in a barrel which, as we know, is constructed from individual small boards. Each of them is arbitrarily equated to a growth factor (mechanization, chemization, land reclamation, organization, economic and social conditions for production activity and the life of the workers, and so forth). All of them can reach the highest level, but if one of them is broken then the level of liquid (the final effect) will

be determined precisely by that one, that is, the factor of the minimum as it has come to be called. The most economical method of increasing the final effectiveness is to influence the factor of the minimum and to achieve an overall balance. This, of course, is a simplified model, and in reality, as a rule, there are several factors of the minimum, and the optimal proportions change with time, so therefore there arises the problem of their prognostication, finding the optimal strategy and tactics for maneuvering investments, and so forth. But the principle of revealing the factor of the minimum--the weakest link in the chain--is one of the fundamental ones on the resource-saving path of intensive growth.

There are many structural problems, but we shall discuss the most important. First and foremost we shall discuss the larger role and the higher technical level of the capital-producing and processing branches of the APK. The problem consists in the creation of high-quality modern systems (complexes) of machines and industrial technologies which significantly reduce the energy-, material- and labor-intensiveness of the production of the final product. We need qualitatively new decisions which cover the tendency toward increased costs of the primary resource obtained from nature (fuel, energy, raw materials). Only under this condition will the price of the new technical equipment and technology not grow more rapidly than the effectiveness of their application does, which is the case now and which is one of the reasons for the increased production cost of agricultural products.

Another problem is the investment policy within agriculture. We know the priorities which have taken form in the past. In first place were investments in direct production--mechanization, chemization, land reclamation, and the creation of animal husbandry complexes, in second place--investments in the industrial infrastructure, and in third place--investments in the social infrastructure. The level of investments in this last area per one rural resident was two-thirds to two-fifths the amount of the investments per urban resident. It was the industrial and social infrastructures with their lags that were the factors of the minimum, through which the effect "leaked out" in the form of large losses of products because of unsatisfactory storage, transportation and processing, and the strong outflow and deterioration of the structure of the labor force in rural areas.

For the 1980's radical changes have been earmarked for the investment policy: in first place in investments will be the social infrastructure (about 160 billion rubles), in second place--the industrial infrastructure (an increase of 40-60 percent) and in third place--agricultural production itself (an increase of 6-8 percent). It must be noted that the effectiveness of the priority of investments in the social infrastructure, which provide for retaining the quantity and improving the quality of the labor force, is fully confirmed by the experience of the Estonian SSR.

At the end of the 1950's and the beginning of the 1960's a correct conclusion was drawn in the republic: the future of agriculture and its effectiveness will be determined by the quality of the labor force in rural areas. It was clear that mechanization and subsequent industrialization of agriculture would reduce the quantitative need for labor force. But the problem of quality would become more crucial. For modern agricultural production, which combines

mechanical and biological factors, is at least no simpler than industrial production and the conditions for working in it are even more difficult. But the pay for labor in agriculture was considerably less than in industry, and even with smaller investments in the social infrastructure.

The Estonian SSR was the first in the country to begin to introduce guaranteed wages in agriculture. At the present time our republic is the only one where the payment for agricultural labor is somewhat higher than the average for the national economy. In turn, this brought about serious discussion, and certain participants in it spoke of our "overpaying" for agricultural labor. But maintaining the relatively good quality of the labor force and increasing the labor activity and initiative of the people have produced their results: the republic has achieved the highest labor productivity (exceeding the level in other Baltic republics 1.5-fold was approximately the same resource potentials), the lowest production cost of the final agricultural product and the smallest proportion of wages in it.

One must say, however, that the necessary quantity and quality of labor force in rural areas can no longer be retained even with relatively high wages. The number of people employed in the republic's agriculture has almost reached the lower limit--less than 12 percent of the working population.<sup>1</sup> Serious disproportions have arisen in the occupational structure of the labor force (a relative reduction of workers in the basic occupations) and its territorial distribution (a critical shortage in the rayons and on the farms with the worst natural and economic conditions).

A solution to this problem can be seen in accelerated development of the social infrastructure in rural areas--construction of modern housing, schools, kindergartens, culture and trade centers which take into account the peculiarities of rural life and create a maximum of modern conveniences. This will require expenditures for the social infrastructure per one resident that are greater than they are in the cities. In rural areas it is important to provide a broader selection of occupations which require higher qualifications and, to this end, to create industrial and other enterprises that are relatively small but have a good technical and technological level and the possibility of maneuvering labor resources during the peak period of agricultural work. The system of occupational training should be restructured correspondingly. A more uniform distribution of the labor force among the various rayons and farms involves solving the problem of equalizing the objective conditions of management and, consequently, wages and development of the social infrastructure.

The second direction: improvement of the utilization of the existing bioclimatic potential of the country as a whole and of each republic, rayon and farm individually. Until recently in agriculture main reliance was placed on the technical and energy factors of growth which, in the final analysis, involved the utilization of fossil fuel energy. These factors provided for up to 80 percent of our growth of agricultural production. But the times of cheap fossil fuel are increasingly becoming a part of the past. Therefore it is necessary to change from a primarily single-factor strategy for intensive growth to a multifactoral one with reliance on the utilization

in agriculture of the bioclimatic and, correspondingly, the human (its knowledge and abilities) potential.

Including bioclimatic resources in the intensification process cannot be reduced simply to a desire to take more from nature. Humanity is obliged to be concerned about restoring natural productivity and retaining the necessary ecological balance. One is bothered by the impoverishment of the natural fertility of the soil because of excessive removal of nutritive substances, which cannot be compensated for simply by applying larger and larger doses of mineral fertilizers. The desire for maximum productivity is far from always justified economically or ecologically. Beyond a certain limit, increasing the production of products from an individual section of land will require a sharp increase in expenditures. Moreover, the strings with the maximum biological productivity most frequently do not have sufficient resistance when there are sharp changes in climatic conditions. In each individual case it is necessary to find the economically and ecologically substantiated optimum between the growth of output and expenditures, biological productivity and resistance (see A. A. Zhuchenko and A. D. Ursul, "Strategiya Adaptivnoy Intensifikatsii Sel'skokhozyaystvennogo proizvodstva" [The Strategy of Adaptive Intensification of Agricultural Production], Kishinev, 1983). Therefore we are speaking primarily about active adaptation of man's production activity to the laws of the natural environment and a correct combination in keeping with their requirements of bioclimatic, technical-technological, organizational and social-economic factors in growth.

Active adaptation is above all correct distribution of agricultural production among the soil and climate zones and microzones of the country and accounting for the peculiarities of each section of land: for the production of which agricultural crops is it most suited, what system of farming will produce the greatest effect while retaining and increasing the fertility of the soil. Calculations and experiments, including in our republic, show that because of efficient distribution of agricultural crops and the application of the corresponding farming systems it is possible to increase the effectiveness of agricultural production by at least one-third with the same investments.

The point that in order to increase animal husbandry production is necessary first of all to increase the production of grain, which is quite correct for the country as a whole, might turn out to be economically and ecologically unjustified in certain regions, for example, in the Estonian SSR. Because of soil and climate factors, the production cost of grain is relatively high in the republic. Expenditures of live labor and energy per ton of feed units from grain are several times higher than for the same quantity of feed units from perennial grasses. The production cost of a feed units from grasses in recent years has been approximately one-half the production cost of a feed unit from grain. In 1974-1979 grasses produced 10-12 percent more protein than grain crops did. Moreover the productivity of grain crops depends to a much greater degree on climatic fluctuations. Thus during the past 10 years the gross yields of grain three times (in 1973, 1978 and 1981) were approximately one-half what they were during years with the normative conditions for sprouting. The fluctuations in the productivity of grasses during the unfavorable years rarely exceed 20 percent (see "Nauchno

Obosnovannaya Sistema Zemledeliya v Estonskoy SSR" [A Scientifically Substantiated System of Farming in the Estonian SSR], Tallinn, 1984).

We are speaking, naturally, not about reducing the gross yields of grain in the Estonian SSR; we are speaking about a more efficient structure for the production and distribution of feeds. For grain crops we should use the most suitable soil and fertilizers, increasing the gross yields as a result of increased productivity and not through excessive expansion of the planted areas.

The third direction: improvement of the system of management and the economic mechanism. Here it is important to realize as fully as possible the advantages of the socialist system of management, to activate the human factor and to aim planning and economic reference points and stimuli toward making sure that each economic unit searches for the most effective resource-saving decisions.

To this end there should be a certain restructuring of all elements of the economic mechanism: planning, the organizational structure of management, economic levers and incentives. Let us discuss the most important problems.

In planning it is necessary first of all to change over from primarily branch planning to target-program planning of the development of the APK which provides the necessary balance of all its elements and the overall direction toward the achievement of the maximum final effect--obtaining the given volume of foodstuffs with a minimum total expenditure per unit of output.

Another problem is finding the optimal combination of the statewide centralized planning basis and initiative, independence and responsibility of local agencies and economic units. Their optimal combination is possible if the centralized planning basis extends to the main strategic positions: determination of the final target points and main paths of scientific and technical progress, improvement of the utilization of the bioclimatic, technical-technological and human potential, establishment of priorities and directions in the investment strategy, and the development of the main economic normatives and levers for planned regulation.

The territorial (republic, oblast, rayon) and economic units must be informed of the major planning and economic parameters (at the entry and exit of a given system): the amounts of deliveries to the union and republic food fund (taking into account an efficient system for distribution of production and evaluations of resource potentials); counterdeliveries of material resources per 1,000 rubles of output; prices for the main kinds of agricultural and industrial products; normatives of payments to centralized funds; centralized financial and credit limits; and limits on construction and installation work. The strengthening of the independence of local agencies and units in solving all of the rest of the range of economic problems will increase the responsibility for the food situation in the local areas and effective utilization of the resource potential, taking into account concrete conditions, which are especially diverse in agriculture. The main difficulty consists in resource and economic support for the adoption of difficult and effective plans by the economic units themselves. This depends on the

substantiation of the entire system of economic normatives and the durability of mutual delivery guarantees, which should be registered in the agreement--the plan-order.

The organizational structure of management needs to be arranged. It is necessary to carry out a stage-by-stage changeover from mainly branch to integrated management of the territorial agroindustrial complex. The dominance of the territorial principle is dictated by the very specific features of agriculture, in which efficient utilization of the two most important factors in production--the land and man--are under rigid territorial determination. The APK makes it possible to provide the proper balance in the local areas (where it is concrete and most visual) of development of agriculture and in the service spheres, production and the infrastructure, and to carry out spatial and interbranch maneuvering of resources in order to bring up the lagging units. The integrated approach also makes it possible to arrange relations of the territorial and national economic levels of the APK on the basis of the final results of production activity and to increase their economic responsibility for the overall state of affairs.

As we know, the Estonian SSR and other republics have successfully conducted an experiment in organizational and economic formation of rayon agroindustrial associations. In the RAPO they found that successful form which provided the best interaction between agricultural and service enterprises, the greatest balance of economic and social development, the bringing up of backward farms and units, the creation of interfarm enterprises, and so forth. On the whole the first RAPO's better utilized the resource potential and achieved the highest rates of development. Therefore after the May (1982) Plenum of the CPSU Central Committee they became the main form of management of the territorial agroindustrial complexes in the country as a whole. But, as was noted at the All-Union Economics Conference, the possibilities that exist in the RAPO are still far from being fully utilized.

The situation is explained both by subjective factors (the attachment of some of the managers to the old administrative-delegation methods of management), and by objective ones--the poor joining of rayon and republic (oblast) levels of management. While at the first level there is a predominance of the integrated approach, in the second level (the republic) the branch approach dominates--union ministries and departments send down planning assignments and resources to their republic ministries and departments.

Certain changes in the direction of the integrated management of the APK at the republic level have been earmarked in connection with the creation on an experimental basis of the union-republic agroindustrial association, Agroprom ESSR, in our republic. Within the framework of the republic they can better solve problems of interaction of agriculture and the service spheres in the local areas, material and labor resources are utilized more effectively, and the management staff is simplified. At the same time certain units of the republic APK are still under the jurisdiction of various departments. For example, with respect to the ministries of fruit and vegetables, procurements and the meat and dairy industry, Agroprom performs only coordination functions. More complete integration is impeded by the various instructions, provisions, and indicators that are in effect in the union ministries and

departments. Deliveries of resources to the republic APK proceed along various channels which are frequently not coordinated.

The problem amounts to more than simply rearranging the organizational structure for management. The main thing is a change in the methods of management. As was pointed out at the All-Union Economics Conference, management should increasingly rely on economic levers for influencing production, and these levers themselves should give rise to research and implementation by all management units of resource-saving ways of intensive development.

Economic methods of management rely on the independence, initiative and responsibility of the economic units within the framework of centrally established assignments and normatives and on the application of principles of cost accounting, beginning with the brigade (brigade contract), complete cost accounting on the kolkhozes and sovkhozes, and the extension of the most important elements of cost-accounting relations to the rayon and republic levels of the APK.

Cost accounting presupposes that the economic units bear full economic responsibility for their decisions and actions--their material situation depends on the effectiveness of their work. But what decisions and actions should the society recognize as effective and deserving of material incentives? Until recently the main indicator was the fulfillment of the plan. And for sales of above-plan products the business received a 50-percent increment to the price. This policy motivated the farms to "push through" in any way possible reduced plans and increased deliveries of resources. Growth rates are now stimulated to a greater degree. But with a low level of production it will be easier to obtain a high growth rate, especially if more resources are coming in. But if the main path for our further development is intensification, then when evaluating and providing incentives for the results of economic activity in first place should be the indicator of the effectiveness of the utilization of the accumulated resource potential (land, capital, labor force) by each territorial and economic unit.

This, however, involves its own problems. We are presenting for the various rayons and individual farms of the Estonian SSR the data for 1982 concerning the differentiation of the levels of net income from agricultural production per hectare of cultivated land. The normative indicator reflects the necessary (in the event of normal work at the average republic level) amount of net income with the given provision of resources (the method developed by R. Tiivel was used for the calculations). The differences in the normative levels reflect the effect of objective (rent) factors. The deviations of the actual level from the normative level reflect the differences in the effectiveness of the management and the utilization of the resource potential among the various rayons and farms.

The figures that have been presented show the great differences in the objective conditions and levels of management, and also in the utilization of the resource potential. Disparities in the coefficients of the utilization of the resource potential in the various rayons reached 200 percent, and even more among the various farms.



Table 1--Differentiated Levels of Income (Profit Per Hectare of Cultivated Land) in Various Rayons of Estonian SSR in 1982

Rayons	Profit From Production of Agricultural Products (rubles/hectare)		Coefficient of Effectiveness of Utilization of Resource Potential (Ratio Between Actual and Normative)
	Actual	Normative	
Valgaskiy	65.83	107.02	0.61
Vil'yandiskiy	202.44	184.55	1.10
Vyruskiy	122.08	98.19	1.24
Yygevaskiy	161.11	156.02	1.03
Kingiseppskiy	149.23	105.07	1.42
Kokhtla-Yarveskiy	133.32	167.31	0.80
Paydeskiy	174.91	175.31	0.99
Pylvaskiy	149.55	137.43	1.09
Pyarnuskiy	184.89	129.16	1.43
Rakvereskiy	231.38	181.90	1.27
Raplaskiy	96.78	122.08	0.79
Tartuskiy	116.51	123.65	0.94
Khaapsalyskiy	124.95	102.36	1.22
Khar'yuskiy	401.29	245.78	1.63
Khiyumaaskiy	100.62	145.34	0.69

Table 2--Differentiated Levels of Income (Profit Per Hectare of Cultivated Land) or Individual Farms of Estonian SSR in 1982

Farms	Profit From Production of Agricultural Products		Coefficient of Effectiveness of Utilization of Resource Potential (Ratio Between Actual and Normative)
	Actual	Normative	
Vinni Sovkhoz	417	187	2.23
Energiya Kolkhoz	155	207	0.75
Rakvereskiy Rayon			
Kungla Kolkhoz	247	179	1.38
Ravila Sovkhoz	87	207	0.42
Khar'yuskiy Rayon			
Varska Sovkhoz	2.33	171	0.013
Saverna Kolkhoz	265	187	1.42
Pylvaskiy Rayon			
Soontagana Kolkhoz	235	93	2.53
Sindi Sovkhoz	267	604	0.44
Pyarnuskiy Rayon			
Linnamyae Kolkhoz	229	120	1.91
Likhyla Sovkhoz	19	50	0.38
Khaapsaluskiy Rayon			

As we can see, there is no need to create an effective mechanism of economic responsibility for management units for the degree of effectiveness of the utilization of the resource potential. It presupposes that when distributing the planning assignments and the resources and when establishing the normative of payments from the farms to centralized rayon and also republic funds in determining the winners in the socialist competition one takes into account the normative estimate of the resource potential and the effectiveness of its utilization.

It is also necessary to create centralized funds which are determined at the republic level (from payments of rayon and branch units of the APK (for economic regulation of industrial and social processes. These include: the fund for development, with which it would be possible to introduce more rapidly the advanced technical and technological decisions and to create facilities of interbranch and interr rayon significance; the fund for compensation for objectively worse conditions for management; the fund for regulation of the ratio between procurement and wholesale prices, and so forth. (Regulation of the ratio of prices by the method of rebates and increments is necessary first and foremost because of the considerable differences in profitability, capital-intensiveness and labor-intensiveness of various kinds of agricultural products.) The creation of these funds, whose amounts would be limited to the need for strengthening the cost accounting of the kolkhozes and sovkhozes, would provide for greater flexibility and efficiency of economic methods of management in order to increase the effectiveness of the functioning of the republic APK.

In his speech at the All-Union Economics Conference Comrade K. U. Chernenko emphasized: "As we know, our party regards concern for the development of agriculture not only as an economic, but primarily as a social task.

"We proceed from the idea that a highly developed, effectively functioning agroindustrial complex is a necessary condition for further improving the material well-being of the people and increasing the effectiveness of the country's entire national economy."

Having set forth an extensive program for improving the well-being of the Soviet people, the 26th CPSU Congress brought to the fore the task of improving the supply of food products for the population. It was embodied in practice in the USSR Food Program which is currently being carried out and which is a most important constituent part of the party's economic strategy in the modern stage. The food problem is the central one in the current decade on both the economic and the political planes. As was already noted above, primary significance was attached to increasing the effectiveness of the utilization of the potential that has been created in agriculture and to obtaining a greater return from resources which are invested in the development of the agroindustrial complex. This will require new approaches, a decisive improvement in the activity of agroindustrial associations, a higher level of all economic work, extensive introduction of cost accounting and the collective contract, and the utilization of other economic levers. In other words, it will require improvement of all that which we mean by management and the economic mechanism.

#### FOOTNOTE

1. Some economists express an opinion concerning the possibility of further reducing the number of people employed in agriculture. Here they usually refer to the example of the United States where about 3 percent of the able-bodied population is employed in agriculture. But it must be taken into account that the soil and climate potential in the United States, according to the estimate of American scientists, exceeds the USSR level 2.5-fold (the more so for the Estonian SSR). The United States has a considerably greater capital-availability and energy-availability for agricultural labor, and a larger proportion of the population is employed in spheres I and III of the APK.

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